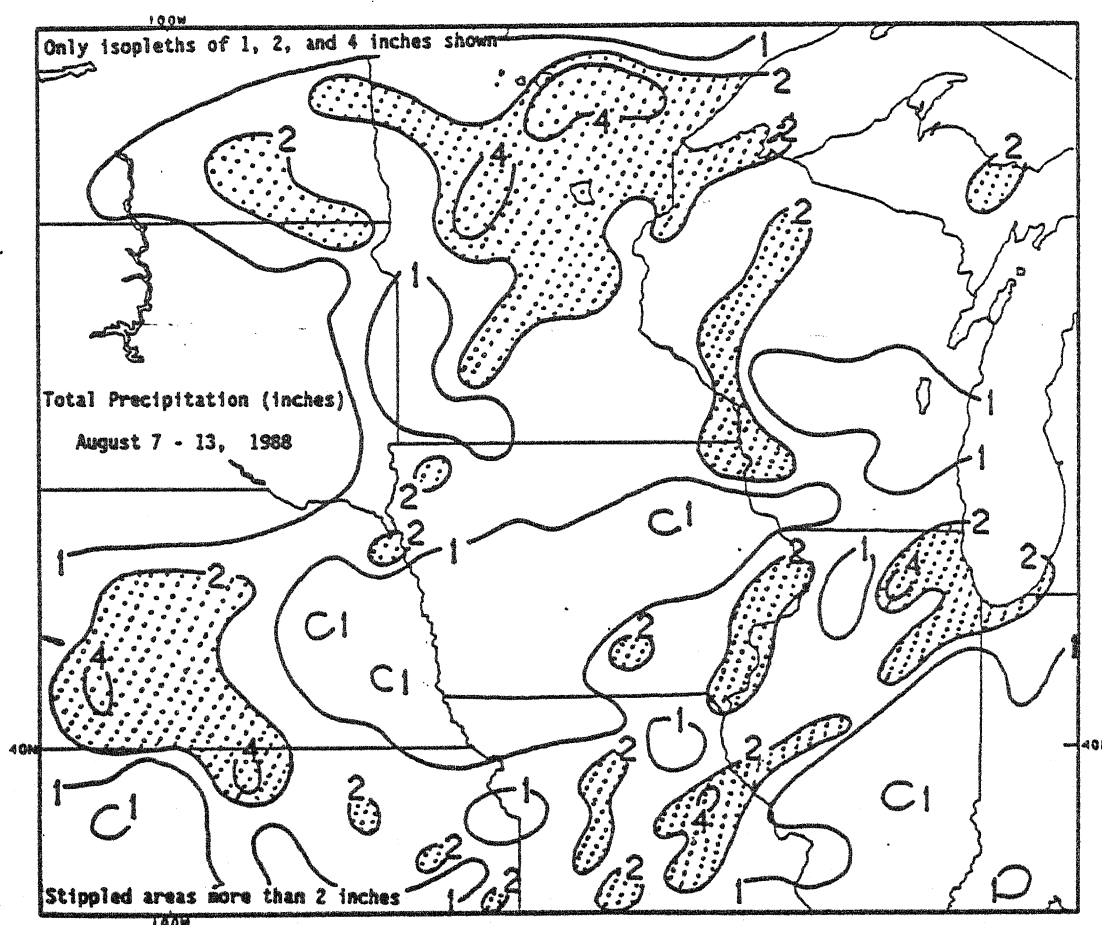


# WEEKLY CLIMATE BULLETIN

No. 88/33

Washington, DC

August 13, 1988



A SLOW MOVING COLD FRONT PRODUCED STRONG THUNDERSTORMS THAT DROPPED SUBSTANTIAL AMOUNTS OF PRECIPITATION ON MUCH OF THE ABNORMALLY DRY AREA OF MINNESOTA, WESTERN WISCONSIN, EASTERN IOWA, NORTHERN ILLINOIS, AND NORTHERN MISSOURI. FARTHER SOUTH, TROPICAL STORM BERYL AND ITS REMNANTS BROUGHT BENEFICIAL RAINS TO THE LOWER MISSISSIPPI VALLEY (SEE U.S. WEEKLY WEATHER HIGHLIGHTS). FOR AN UPDATE ON THE DROUGHT, REFER TO THE SPECIAL CLIMATE SUMMARY.

## WEEKLY CLIMATE BULLETIN

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This Bulletin is issued weekly by the Climate Analysis Center and is designed to indicate, in a brief, concise format, current surface climatic conditions in the United States and around the world. The Bulletin contains:

Highlights of major global climatic events and anomalies.  
U.S. climatic conditions for the previous week.  
U.S. apparent temperatures (summer) or wind chill (winter).  
Global two-week temperature anomalies.  
Global four-week precipitation anomalies.  
Global monthly temperature and precipitation anomalies.  
Global three-month precipitation anomalies (once a month).  
Global twelve-month precipitation anomalies (every 3 months).  
Global temperature anomalies for winter and summer seasons.  
Special climate summaries, explanations, etc. (as appropriate).

Most analyses contained in this Bulletin are based on preliminary, unchecked data received at the Center via the Global Telecommunication System. Similar analyses based on final, checked data are likely to differ to some extent from those presented here.

To receive copies of the Bulletin or change mailing address, write to:

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# GLOBAL HIGHLIGHTS

MAJOR CLIMATIC EVENTS AND ANOMALIES AS OF AUGUST 13, 1988  
(Approximate duration of anomalies is in brackets.)

## 1. United States and Canada:

HOT AND DRY CONDITIONS CONTINUE.

Unusually warm conditions persisted in the north central and northeastern United States with temperatures as much as 5.8°C (10.4°F) above normal in New England. Some areas had heavy precipitation. Up to 147.3 mm (5.8 inches) was reported in the upper Great Lakes region and up to 233.7 mm (9.2 inches) fell in the central Gulf States. Little or no precipitation, generally less than 14.7 mm (0.58 inch), fell elsewhere. See U.S. Weekly Weather Highlights for more details [22 weeks dry - 15 weeks warm].

## 2. China:

HIGHLY VARIABLE PRECIPITATION PATTERNS PERSIST.

While parts of north central and south central China were inundated with torrential downpours of as much as 309.0 mm (12.17 inches) of rain, much of eastern and southeastern China remained abnormally dry with precipitation amounts generally below 17.0 mm (0.67 inch) [10 weeks].

## 3. Southern Europe and Northern Africa:

AREA REMAINS UNUSUALLY HOT.

Temperatures averaged as much as 7.6°C (13.7°F) above normal as the heat wave persists [7 weeks].

## 4. South Africa:

VERY WARM CONDITIONS EASE.

Temperatures returned to near normal except for above normal temperatures in eastern South Africa [Ending at 2 weeks].

## 5. Bolivia:

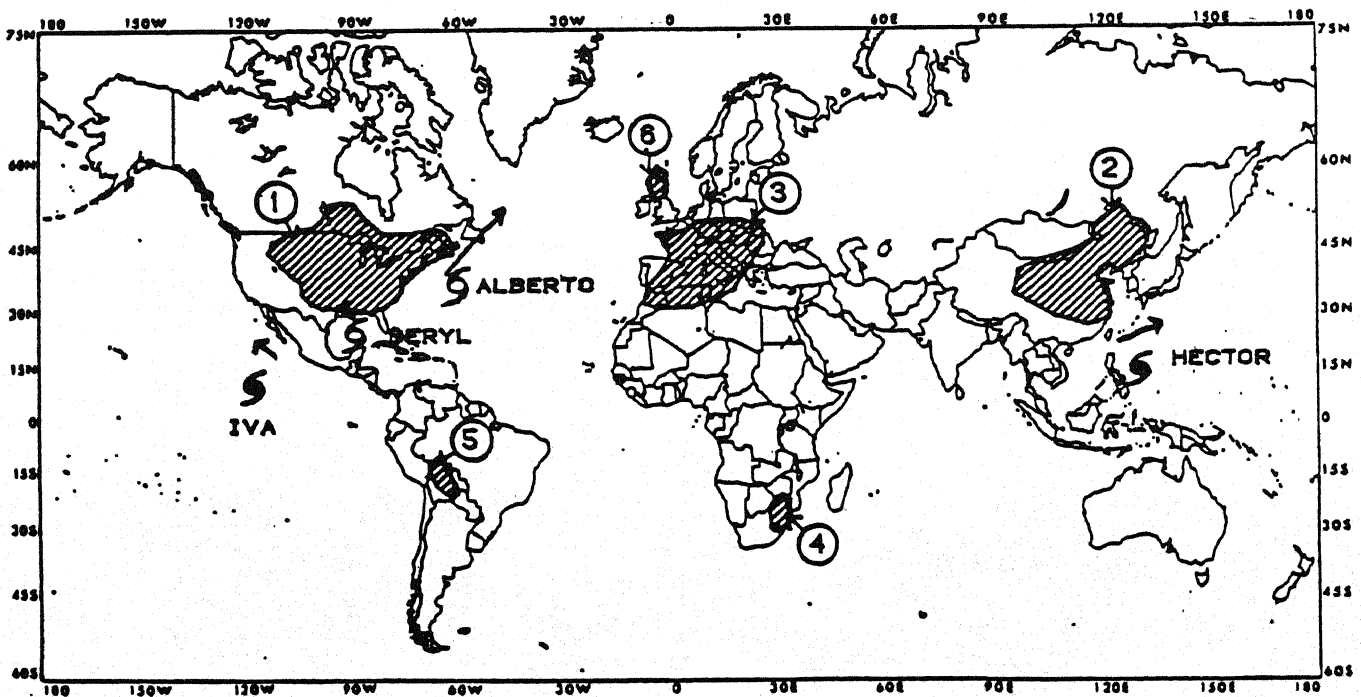
CONTINUED UNUSUALLY COOL.

Temperatures as much as 3.3°C (5.9°F) below normal were very common across the region as the cold spell persisted [6 weeks].

## 6. Scotland:

HEAVY RAINS DIMINISH.

Near normal or below normal rainfall was reported last week as unusually wet conditions ended [Ended at 6 weeks].



Approximate locations of the major anomalies and events described above are shown on this map. See the other world maps in this Bulletin for current two-week temperature anomalies, four-week precipitation anomalies, and (occasionally) longer-term anomalies.

# U.S. WEEKLY WEATHER HIGHLIGHTS

FOR THE WEEK OF AUGUST 7 THROUGH AUGUST 13, 1988

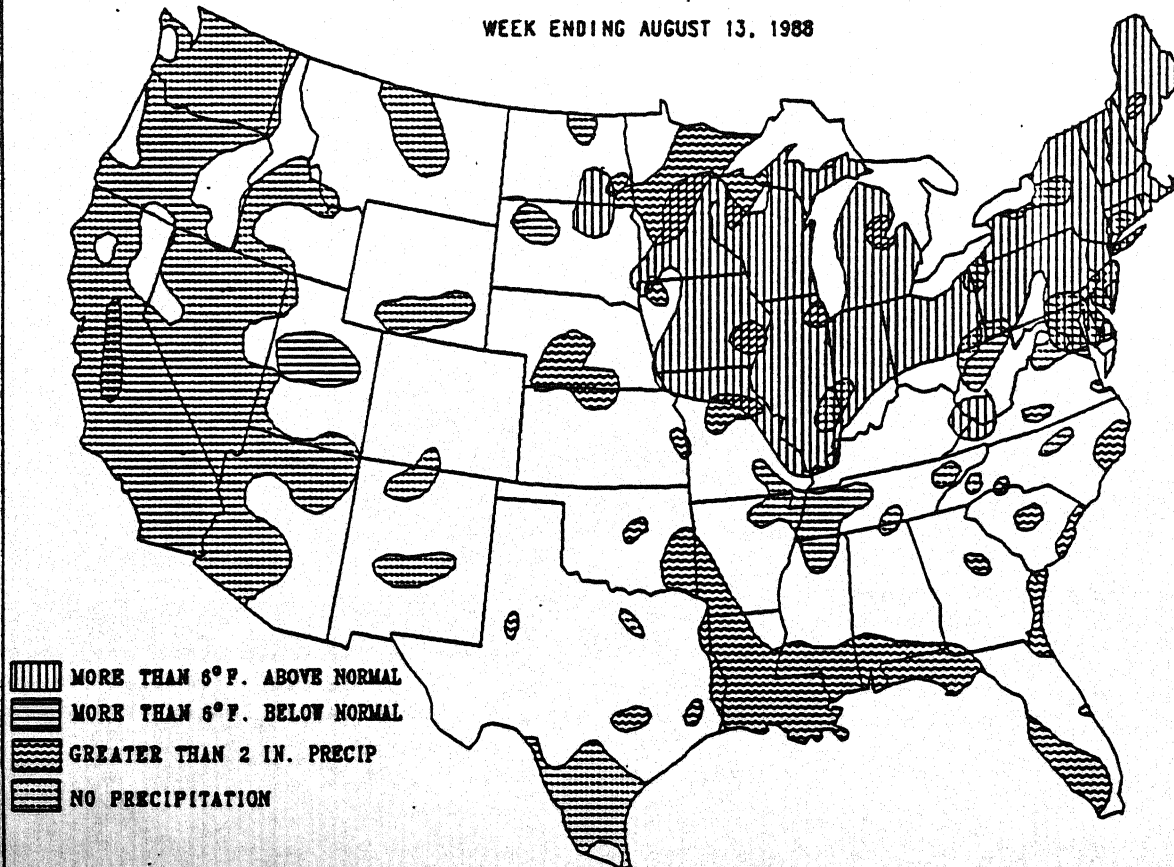
Torrential showers and thunderstorms from tropical storm Beryl brought heavy rainfall to portions of the central Gulf Coast and lower Mississippi Valley as Beryl formed inland over Louisiana's Lake Pontchartrain, slowly drifted southeastwards into the Gulf of Mexico off the coasts of Mississippi and Louisiana, then tracked to the northwest and dissipated over western Louisiana and northeastern Texas (see Figure 1). Significant precipitation also fell along the coasts of southwestern and southeastern Florida, from the central North Carolina coast southward to northeastern Florida in association with a tropical disturbance, in south-central Maine, extreme southeastern Alaska, at Hilo, Hawaii, and on parts of the central Great Plains, upper Midwest, and western Corn Belt regions as a slow-moving cold front produced strong thunderstorms (see front cover, Table 1). Weekly totals exceeded 6.0 inches along the Mississippi, Alabama, southwestern Florida, and south-central North Carolina coasts, while amounts between 4 and 6 inches were found at stations in southern Louisiana, extreme southeastern Oklahoma, north-central Kansas, and in central Minnesota according to the River Forecast Centers. Light to moderate precipitation was observed in central Oregon, throughout much of the Great Plains from eastern Montana and North Dakota southward to New Mexico and central Texas, and at a majority of the locations in the Midwest, Great Lakes, New England, and the Gulf and Southern Atlantic coastal states. Little or no rainfall was measured in the normally dry western U.S., and in the central Rockies,

southern Texas, western New York, and from northeastern Louisiana northeastward to New Jersey.

Unseasonably hot and humid conditions continued throughout the eastern half of the nation, most notably in the southern Great Plains, Great Lakes, Ohio Valley, New England, and mid-Atlantic regions, as high pressure dominated the area and inhibited the southward and eastward progression of cooler air from Canada. Departures of +9 to +11°F prevailed in the Middle Mississippi Valley, Great Lakes, and New England areas (see Table 2), while temperatures averaged between 4 and 8°F above normal in the upper Midwest, southern half of the Great Plains, Tennessee and Ohio Valleys, and mid-Atlantic regions. The northern thirds of the Rockies and the Great Plains, the High Plains, Southeast, and Hawaii were generally near to slightly above normal. Highs surpassing 100°F were plentiful from southern Texas northward to eastern Nebraska, Iowa, and western Illinois, in the Dakotas, and in the normally hot desert Southwest and interior California (see Figure 2). Elsewhere, readings in the mid to upper nineties were common at most stations east of the Mississippi River. Cooler weather continued in sections of the western and southwestern U.S. as departures of -4 to -8°F were located in much of California, southern Nevada, and western Utah (see Table 3). Slightly below normal temperatures occurred along the Pacific Northwest Coast, in the southern Rockies, along the central Gulf and eastern Florida coasts, and throughout most of Alaska.

## WEEKLY WEATHER FEATURES

WEEK ENDING AUGUST 13, 1988



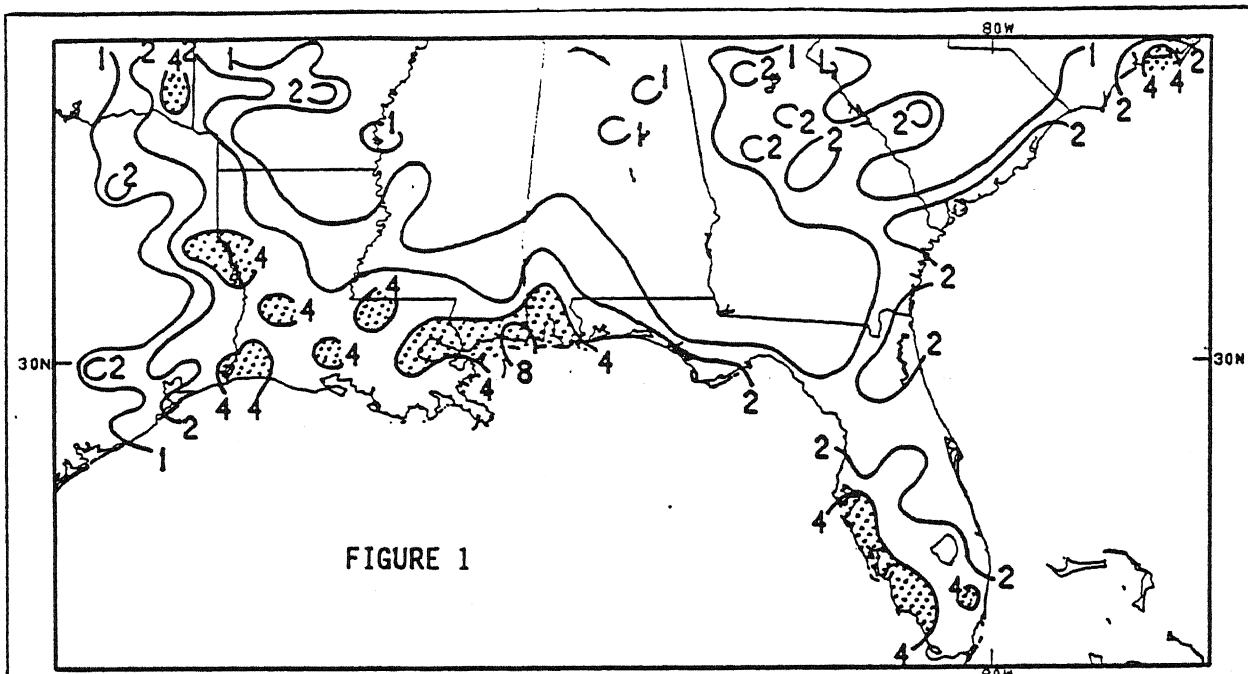


Figure 1. Total precipitation (inches) during August 7-13, 1988. Isopleths drawn only for 1, 2, 4, and 8 inches, stippled areas above 4 inches. Tropical storm Beryl dumped heavy rains on portions of the Gulf Coast and Lower Mississippi Valley (up to 9.2 inches in southern Mississippi).

TABLE 1. Selected stations with two and one-half or more inches of precipitation for the week.

Hilo/Lyman, Hawaii, HI	11.59	Alexandria/England AFB, LA	3.33
Biloxi/Keesler AFB, MS	8.97	Valparaiso/Eglin, FL	3.14
Cherry Point, FL	7.86	Columbia, SC	3.00
Hibbing, MN	7.06	Annette Island, AK	2.99
Mobile, AL	6.96	Pensacola NAS, FL (NPA)	2.99
New Bern, NC	5.30	Duluth, MN	2.95
Alexandria, MN	5.18	Pensacola, FL (PNS)	2.91
Lafayette, LA	5.04	Jacksonville, FL	2.82
Yakutat, AK	4.76	St. Cloud, MN	2.76
Fort Myers, FL	3.78	Gwinn/Sawyer AFB, MI	2.76
Lake Charles, LA	3.56	New Orleans NAS, LA	2.71
Park Falls, WI	3.54	Shreveport, LA	2.64
Savannah, GA	3.53	Tampa, FL	2.64
Baton Rouge, LA	3.51	North Platte, NE	2.63
Port Arthur, TX	3.45	Saginaw, MI	2.63
Panama City/Tyndall, FL	3.36	Eau Claire, WI	2.50

TABLE 2. Selected stations with temperatures averaging greater than 8°F ABOVE normal for the week.

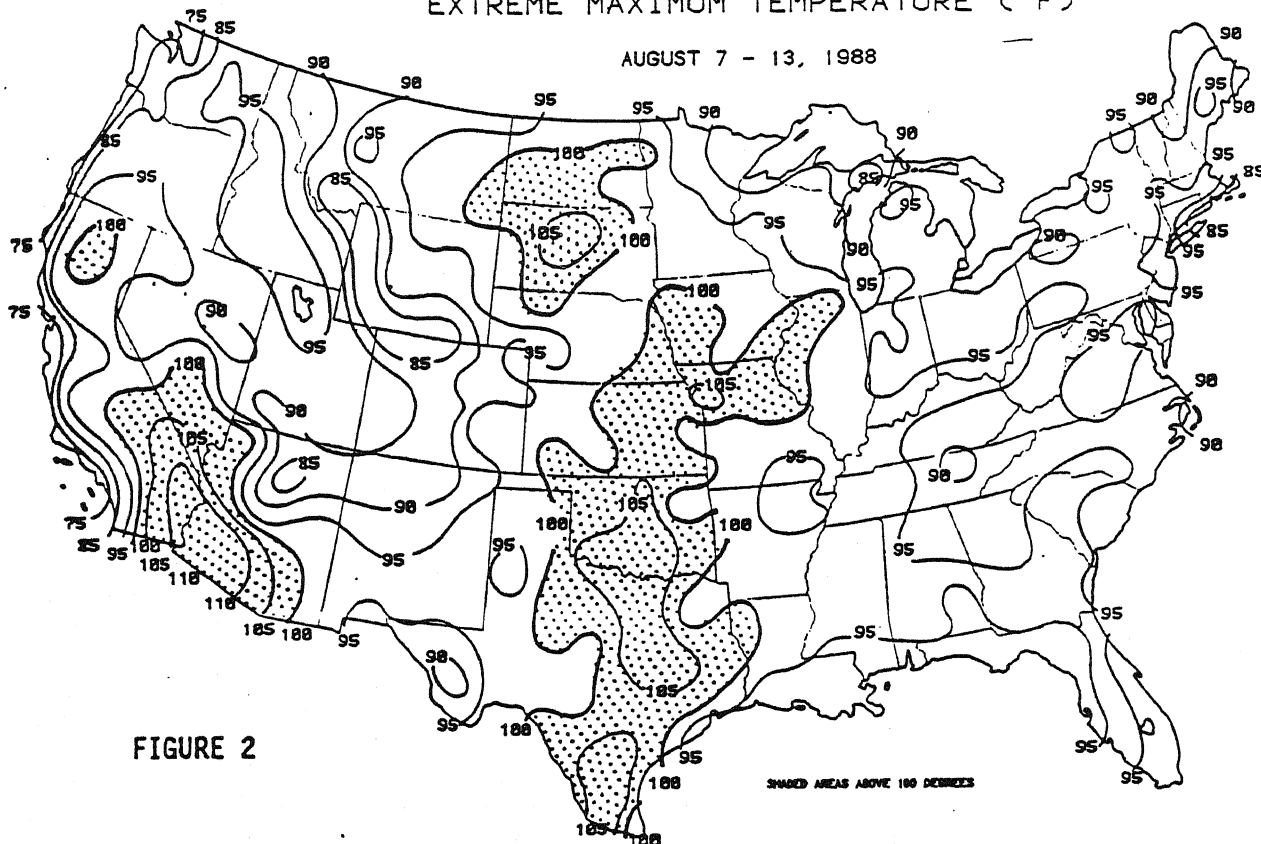
Station	TDevNml	AvgT(°F)	Station	TDevNml	AvgT(°F)
Portland, ME	+11	79	New York/La Guardia, NY	+9	85
Lebanon, NH	+11	78	Ottumwa, IA	+9	84
Newark, NJ	+10	86	South Bend, IN	+9	81
Boston/Logan, MA	+10	83	Detroit, MI	+9	81
Providence, RI	+10	82	Islip, NY	+9	81
Hartford, CT	+10	82	Albany, NY	+9	79
Lansing, MI	+10	79	Flint, MI	+9	79
Augusta, ME	+10	79	Glens Falls, NY	+9	78
Worcester, MA	+10	79	Bangor, ME	+9	77
Concord, NH	+10	78	Rumford, ME	+9	75
Burlington, VT	+10	78	Houghton Lake, MI	+9	75
Montpelier, VT	+10	75	Caribou, ME	+9	73
St. Louis, MO	+9	87			

TABLE 3. Selected stations with temperatures averaging greater than 3°F BELOW normal for the week.

Station	TDevNml	AvgT(°F)	Station	TDevNml	AvgT(°F)
Delta, UT	-8	68	Imperial, CA	-4	88
Paso Robles, CA	-7	67	Las Vegas, NV	-4	85
Big Delta, AK	-7	50	Daggett/Barstow, CA	-4	84
Stockton, CA	-6	71	Marysville, CA	-4	74
Bettles, AK	-6	51	Long Beach, CA	-4	71
Blythe, CA	-5	89	Sacramento, CA	-4	71
Bakersfield, CA	-5	78	Caliente, NV	-4	71
Ely, NV	-5	62	Cedar City, UT	-4	69
Meacham, OR	-5	58			

# EXTREME MAXIMUM TEMPERATURE (°F)

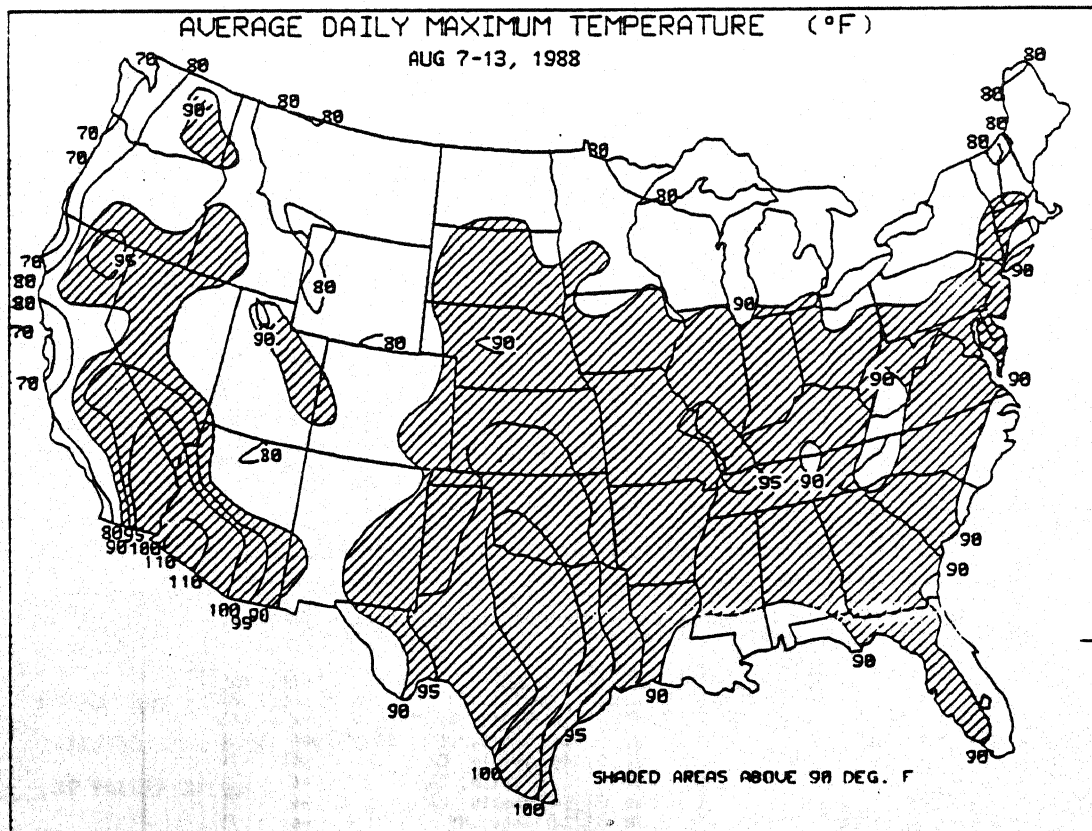
AUGUST 7 - 13, 1988

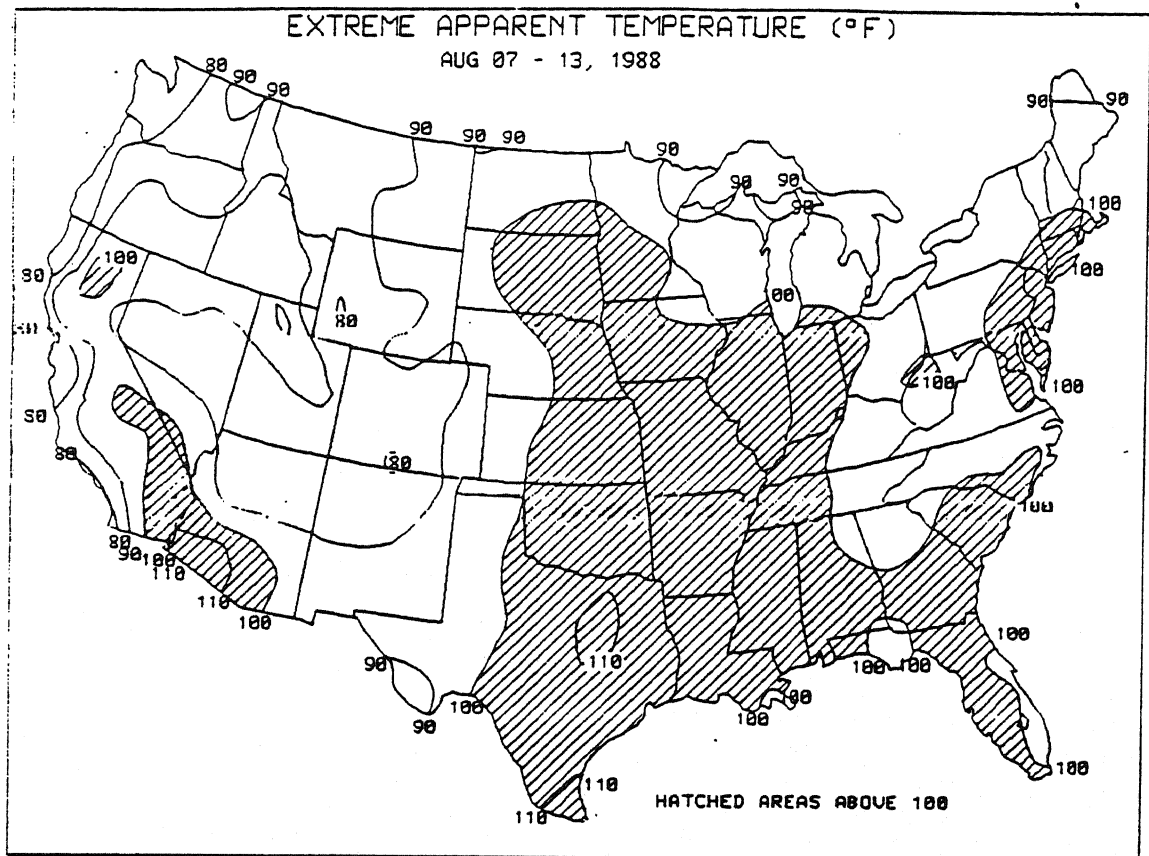


Highs surpassed 100°F in parts of the Great Plains and Midwest, and reached into the nineties elsewhere in the eastern third of the country (Figure 2), while weekly maximum temperatures AVERAGED more than 90°F throughout a large majority of the United States (bottom).

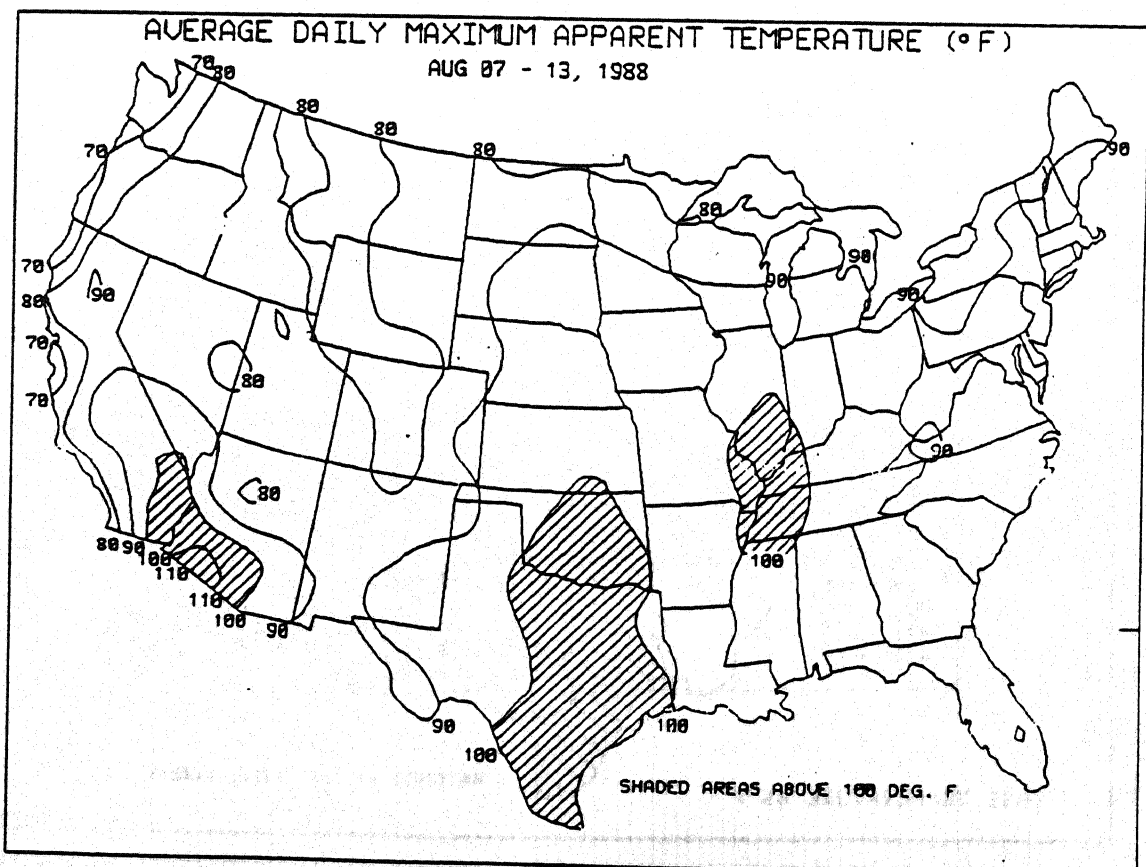
## AVERAGE DAILY MAXIMUM TEMPERATURE (°F)

AUG 7-13, 1988

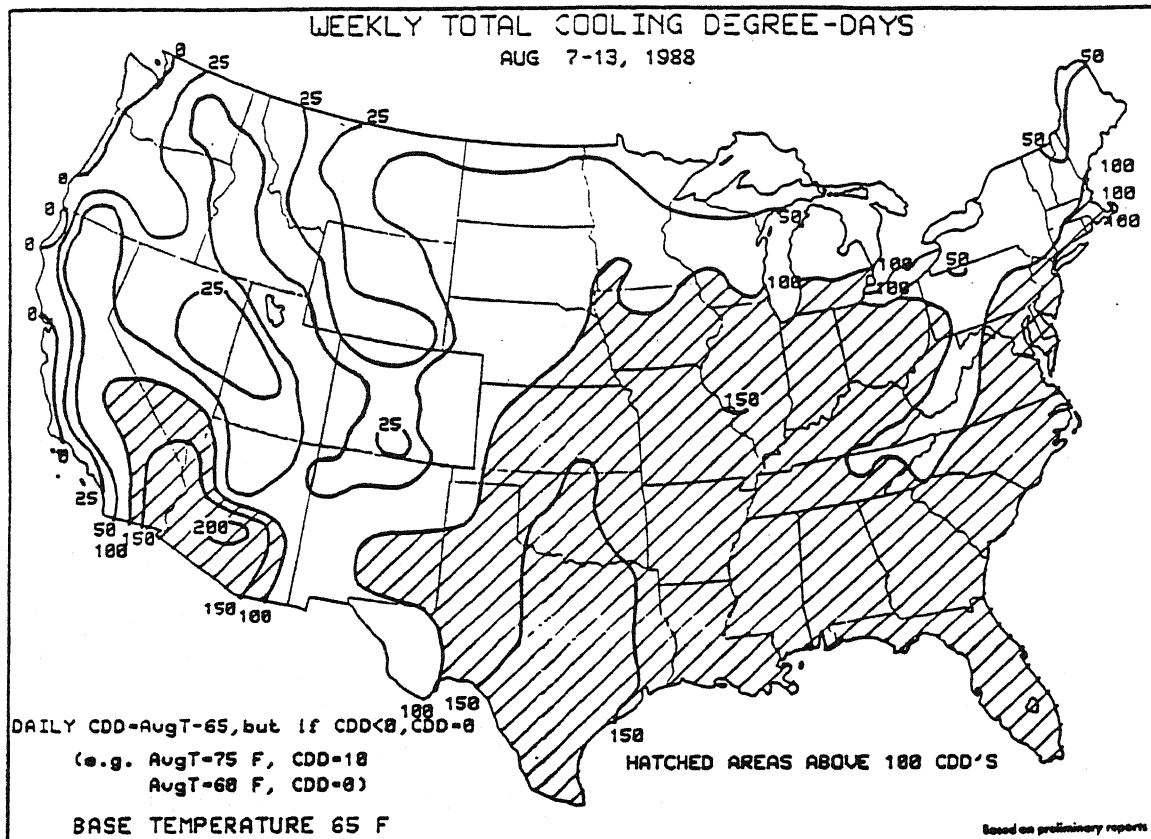




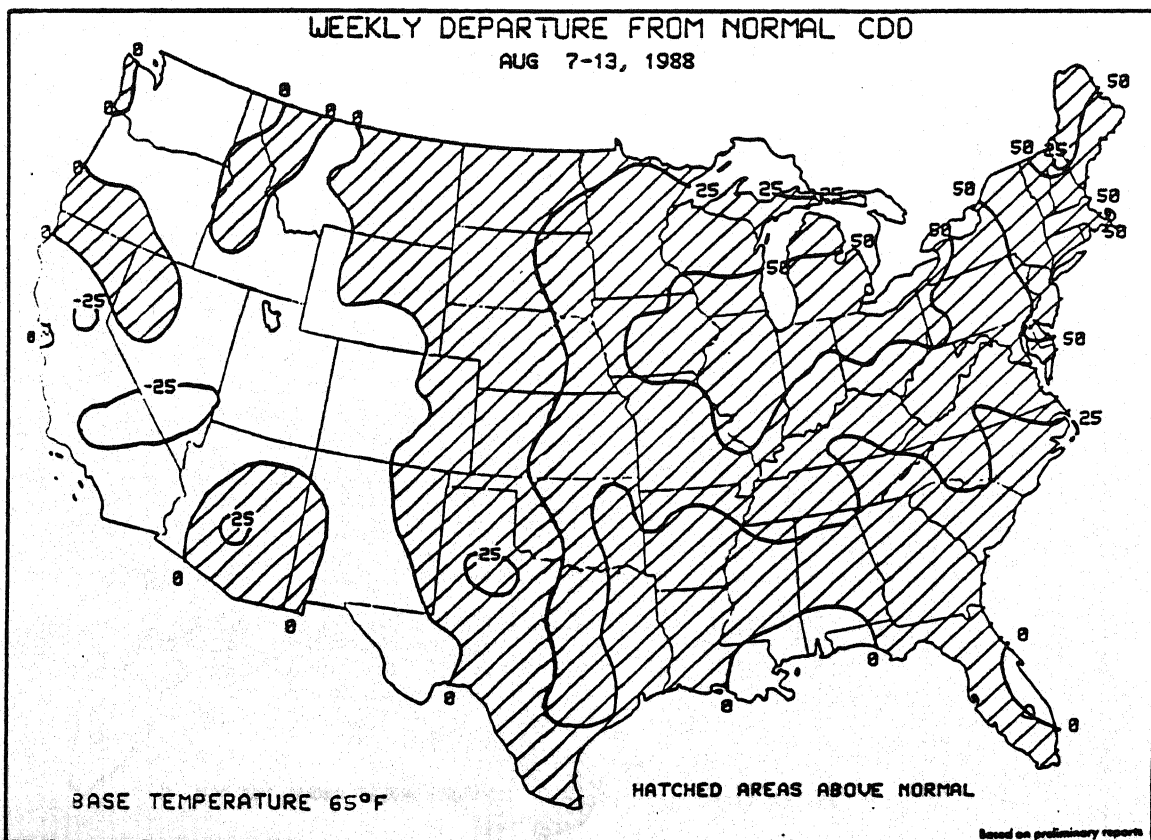
Oppressive heat and humidity afflicted most of the eastern half of the U.S. as apparent temperatures topped the century mark at least once last week (top), while the desert Southwest, southern Great Plains, and Middle Mississippi Valley maximum apparent temperatures averaged over 100°F (bottom).







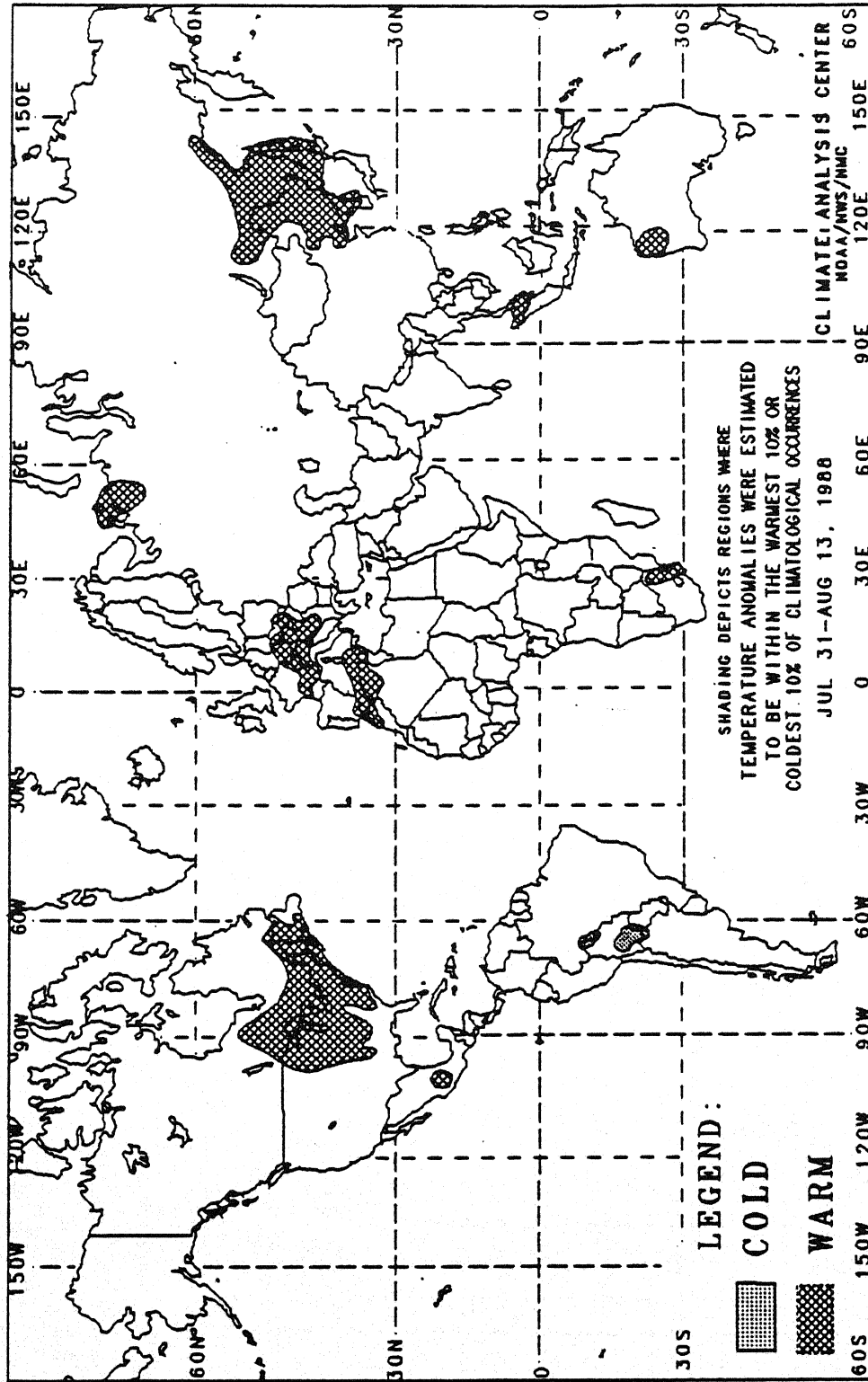
Relentless hot weather pushed the weekly air conditioning totals well over 100 cooling degree days (CDD) in the eastern and southwestern U.S. (top) and created weekly CDD departures exceeding +50 in the Midwest and New England regions (bottom).





# GLOBAL TEMPERATURE ANOMALIES

2 Week



The anomalies on this chart are based on approximately 2500 observing stations for which at least 13 days of temperature observations were received from synoptic reports. Many stations do not operate on a twenty-four hour basis so many night time observations are not taken. As a result of these missing observations the estimated minimum temperature may have a warm bias. This in turn may have resulted in an overestimation of the extent of some warm anomalies.

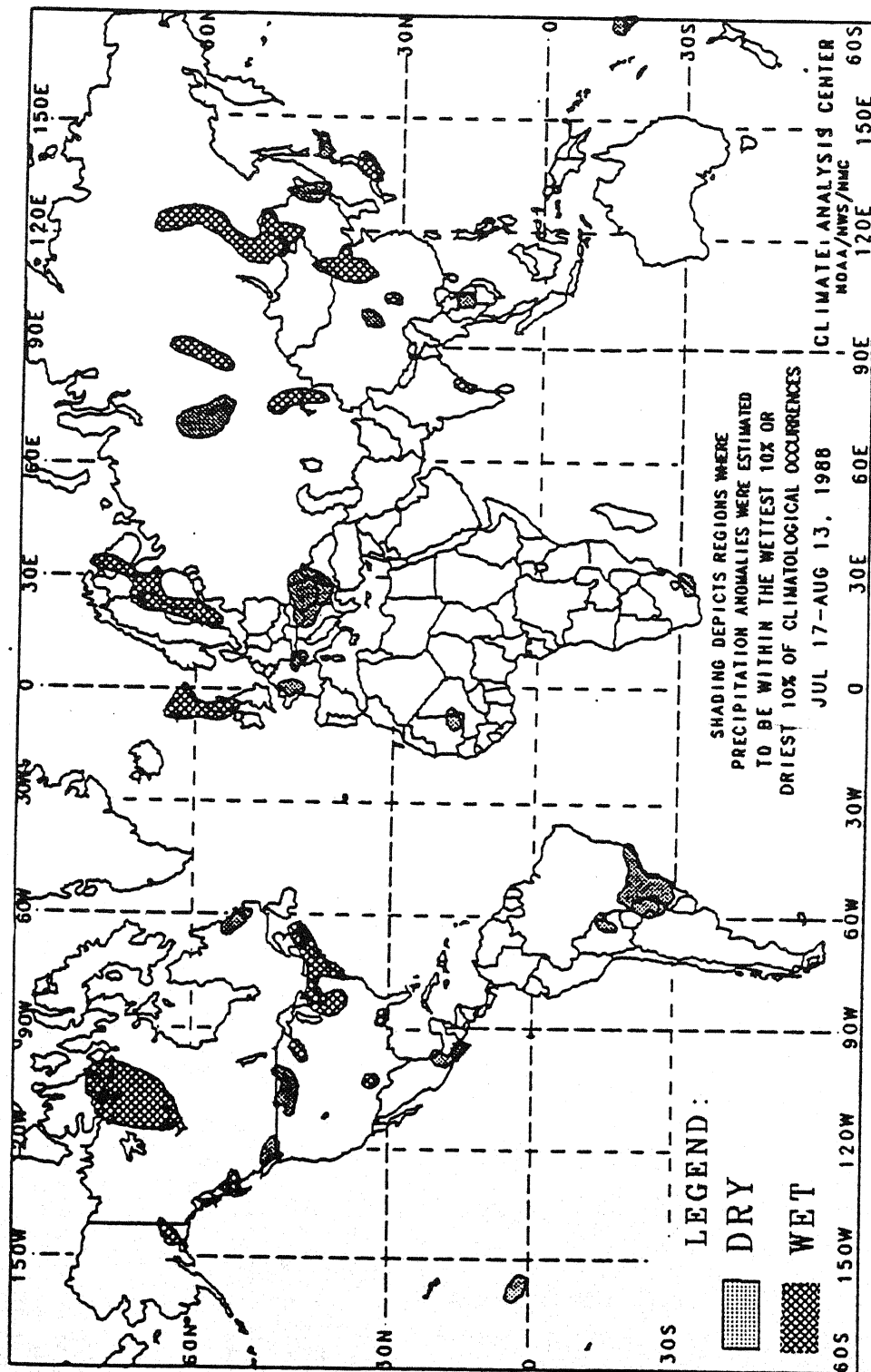
Temperature anomalies are not depicted unless the magnitude of temperature departures from normal exceeds 1.5°C.

In some regions, insufficient data exist to determine the magnitude of anomalies. These regions are located in parts of tropical Africa, southwestern Asia, interior equatorial South America, and along the Arctic Coast. Either current data are too sparse or incomplete for analysis, or historical data are insufficient for determining percentiles, or both. No attempt has been made to estimate the magnitude of anomalies in such regions.

The chart shows general areas of two week temperature anomalies. Caution must be used in relating it to local conditions, especially in mountainous regions.

# GLOBAL PRECIPITATION ANOMALIES

4 Week



The anomalies on this chart are based on approximately 2500 observing stations for which at least 27 days of precipitation observations (including zero amounts) were received or estimated from synoptic reports. As a result of both missing observations and the use of estimates from synoptic reports (which are conservative), a dry bias in the total precipitation amount may exist for some stations used in this analysis. This in turn may have resulted in an overestimation of the extent of some dry anomalies.

In climatologically arid regions where normal precipitation for the four week period is less than 20 mm, dry anomalies are not depicted. Additionally, wet anomalies for such arid regions are not depicted unless the total four week precipitation exceeds 50 mm.

In some regions, insufficient data exist to determine the magnitude of anomalies. These regions are located in parts of tropical Africa, southwestern Asia, interior equatorial South America, and along the Arctic Coast. Either current data are too sparse or incomplete for analysis, or historical data are insufficient for determining percentiles, or both. No attempt has been made to estimate the magnitude of anomalies in such regions.

The chart shows general areas of four week precipitation anomalies. Caution must be used in relating it to local conditions, especially in mountainous regions.

*National Weather Service, NOAA*

ABNORMAL DRYNESS CONTINUES IN PORTIONS OF THE NORTHERN GREAT PLAINS AND THE MISSISSIPPI AND OHIO VALLEYS, BUT THE AREAL COVERAGE OF REGIONS WITH LESS THAN 50% OF NORMAL PRECIPITATION SINCE APRIL 1 HAS DIMINISHED OVER THE PAST SIX WEEKS; HOWEVER, UNUSUAL WARMTH HAS AFFLICTED MUCH OF THE NORTHERN AND EASTERN U.S.

Significant rainfall during July and August over the Gulf Coast, Lower and Upper Mississippi Valleys, Ohio and Tennessee Valleys, and sections of the northern Great Plains have reduced the areal coverage of regions with less than 50% of normal precipitation since April 1 (see Figure 1).

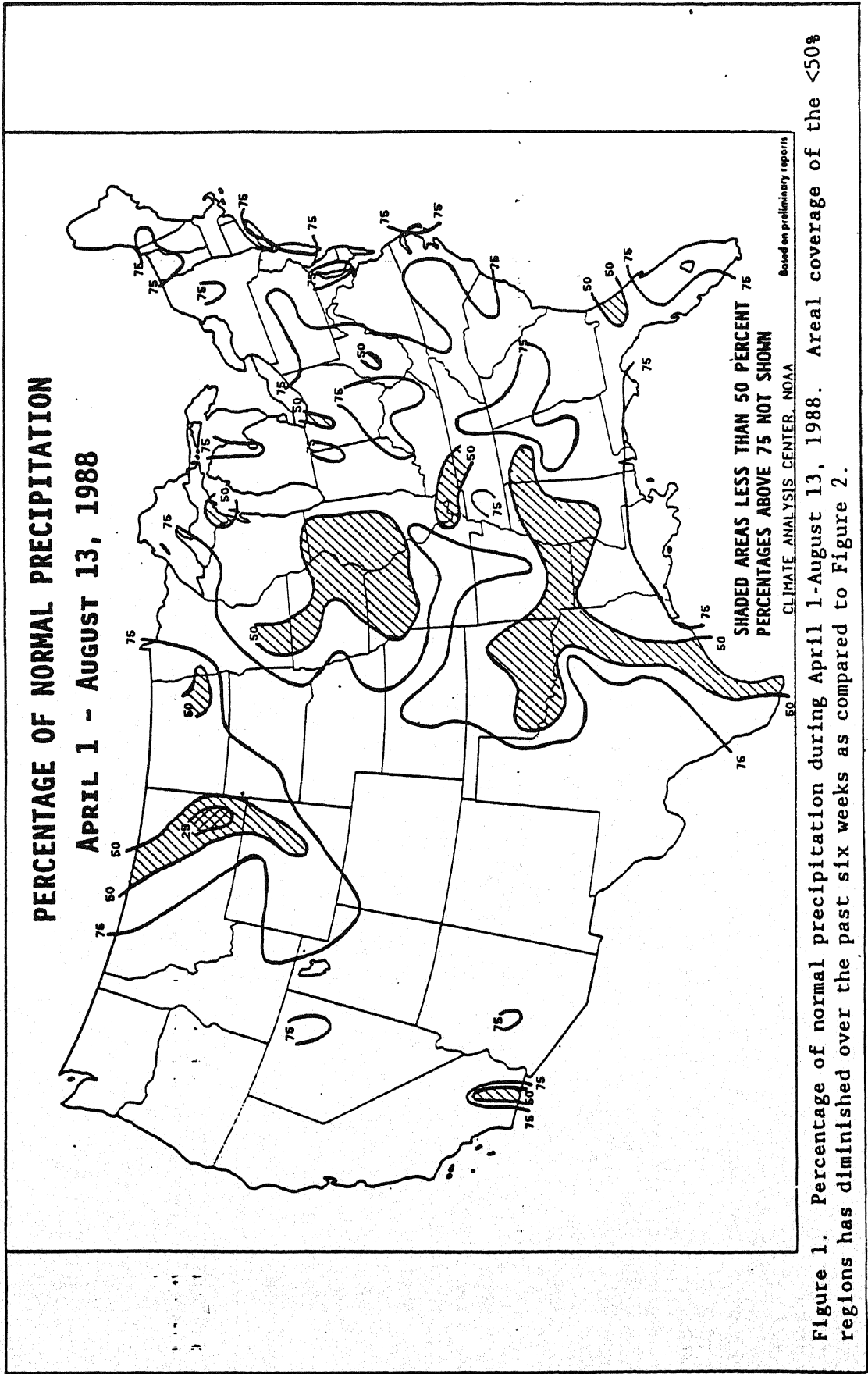


Figure 1. Percentage of normal precipitation during April 1-August 13, 1988. Areal coverage of the <50% regions has diminished over the past six weeks as compared to Figure 2.

the entire Missouri and Mississippi Valleys had measured well under half their normal precipitation, much of this area has received some short-term moisture relief over the past six weeks.

## PERCENTAGE OF NORMAL PRECIPITATION

APRIL 1 - JUNE 25, 1988

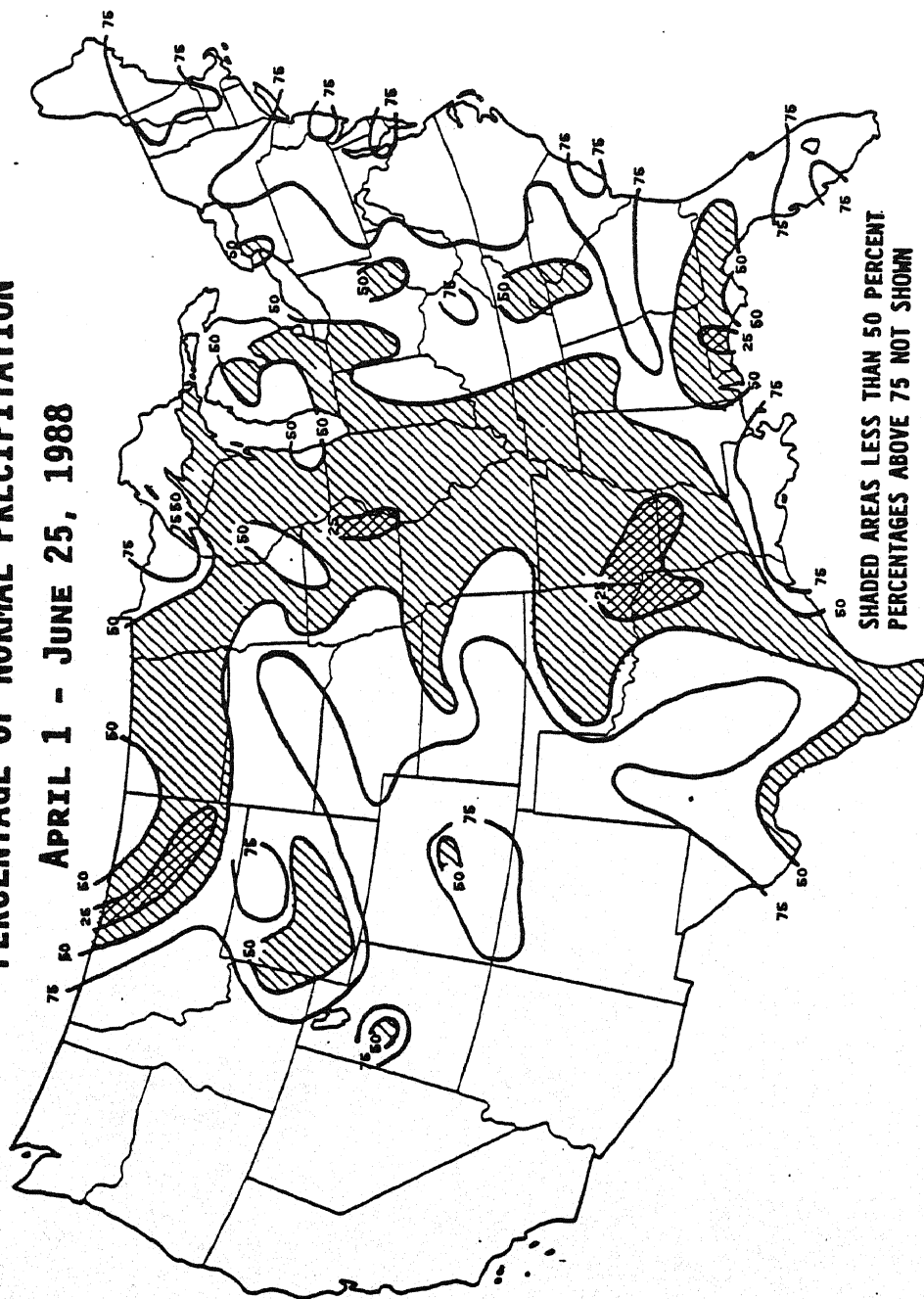


Figure 2. Percentage of normal precipitation during April 1-June 25, 1988. This time period had the largest extent of areas that recorded less than half their normal precipitation.

The precipitation departures since April 1, however, are still exceeding eight inches in many locations, and deficiencies greater than 12 inches are found in parts of eastern Iowa, northern Illinois, and northern Florida (see Figure 3). Continued above normal rainfall for several more weeks/months over the eastern half of the U.S., especially in the aforementioned regions, is still required to substantially ameliorate long-term moisture deficits and hydrological impacts.

### PRECIPITATION DEPARTURE FROM NORMAL (INCHES)

APRIL 1 - AUGUST 13, 1988

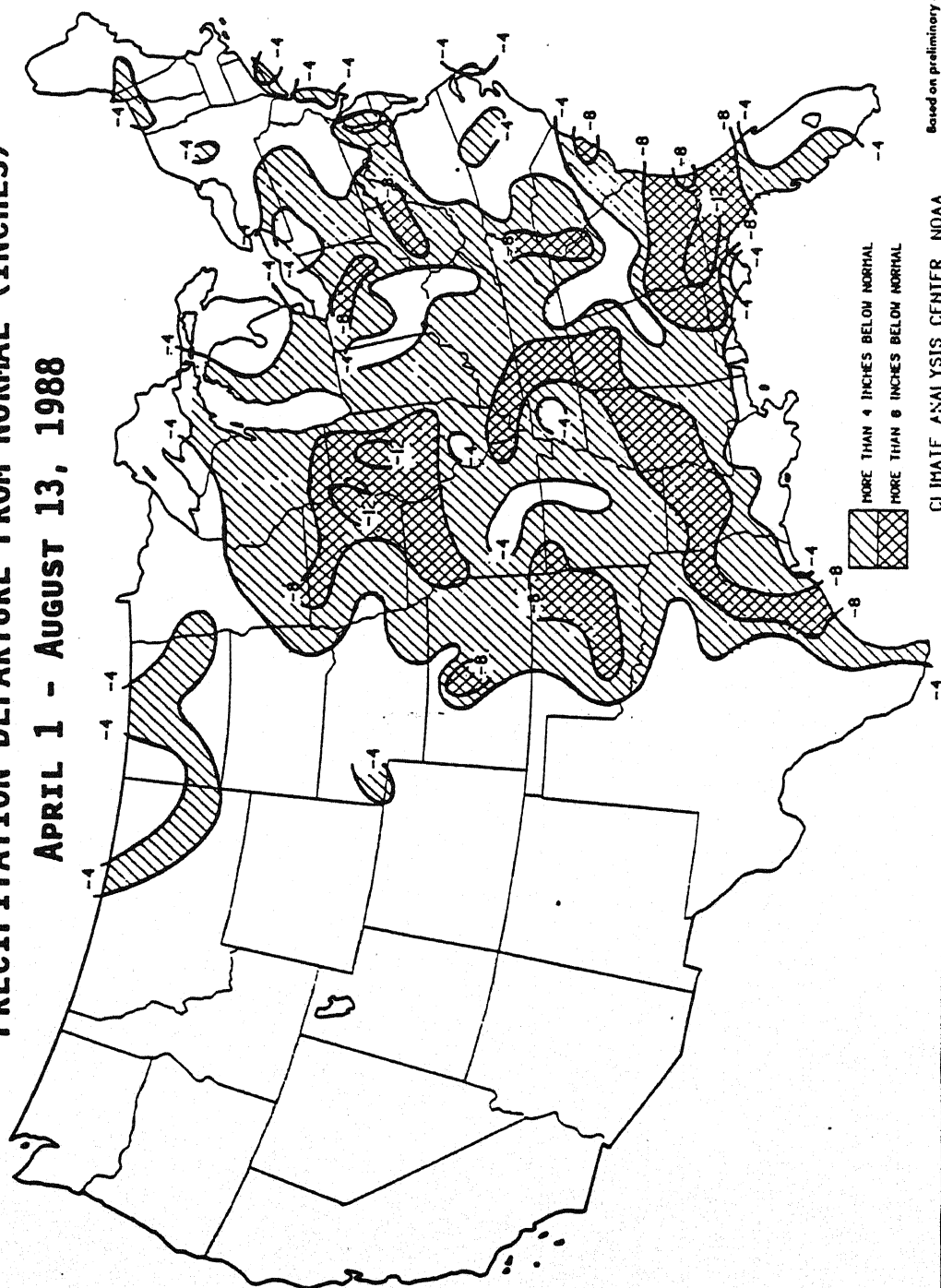


Figure 3. Precipitation departures from normal since April 1, 1988. Only isopleths of -4, -8, and -12 inches are depicted. Deficits exceeding 12 inches still exist in parts of the Midwest and South.

Unfortunately, as the precipitation has generally increased in most sections of the eastern U.S. within the past month, so has the temperatures. Since the first day of August, temperatures have averaged more than 6°F above normal throughout the Midwest, Great Lakes, mid-Atlantic, and New England states (see Figure 4). Highs during August 1-13 have averaged over 90°F at many locations, while parts of the southern Great Plains have averaged over 100°F (figure not shown). Records for the number of days exceeding 90, 95, or 100°F have or nearly have been broken at many stations, while this year threatens to become the all-time warmest August and/or Summer in the northern and eastern U.S.

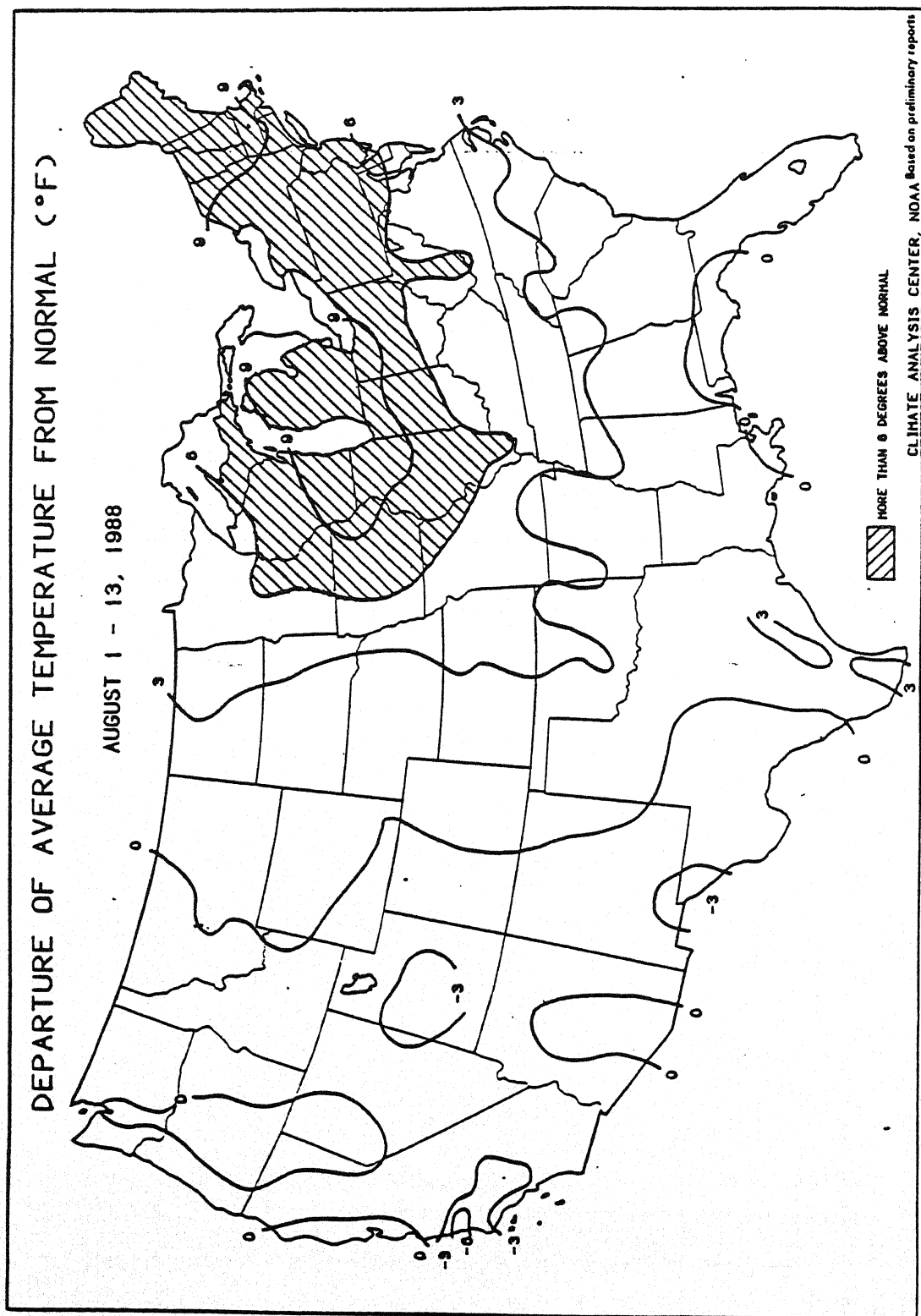


Figure 4. Temperature departures from normal (°F) from Aug. 1-13, 1988. A large majority of the northern and eastern U.S. has been afflicted with abnormally hot and humid weather during August.

